Williamsburg Recv
+ Storage
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JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

June 24, 2004



Mr. Andy Smits, P.E.
Inland Seas Engineering, Inc.
1755 Barlow Street
P.O. Box 6820
Traverse City, Michigan 49696-6820

Dear Mr. Smits:

SUBJECT: Williamsburg Receiving and Storage
Whitewater Township, Grand Traverse County

We have completed our review of the document "Hydrogeologic Study Report" (HSR) which was required pursuant to Consent Order No. 31–07–02. The purpose of the study was to determine if groundwater had been impacted by cherry brining activities at the site. The hydrogeologic study also allowed for further characterization of the site lithology as well as groundwater flow direction. The sediments encountered during the investigation are typical of glacial morainal deposits. There is much interbedding of poorly sorted sands and or clay/silt layers. The silt/clay layers or lenses are not continuous across the site. Groundwater beneath the site is encountered at varying depths due to the surface topography of the site and can also be located in perched conditions above the non-continuous clay layers/lenses. The perched groundwater flow direction tends to follow the slope of the top of clay. Based on the complex hydrogeologic setting of the study area as evidenced by the groundwater contour map depicted as Figure 2 in the HSR, some additional evaluation of the site is warranted. Listed below are the recommended items to be included in the follow-up investigation.

**Top of Clay Contour Map**

A top of clay contour map should be prepared based on the soil boring logs. The purpose of the map is to visually define the extent of clay. This map will enhance our understanding of the shallow groundwater at the site as depicted in Figure 2 in the HSR.

**Clay Thickness Isopach Map**

It is recommended to prepare a clay thickness isopach map for the WRS site. This map will enhance the characterization of the site by aerially depicting where the clay exists at sufficient thickness to protect underlying groundwater from surface discharges and also areas of the site where less protection is present. Use of existing soil boring logs should be sufficient to prepare this map.

**Groundwater Sampling**

The proposed groundwater monitoring plan as presented on page 17 of the HSR should include monitor well MW-301 as well as the parameters dissolved iron and dissolved manganese.

**Groundwater Contour Map**

A new groundwater contour map should be prepared by measuring static water levels in the same monitor wells that were used to generate Figure 2 of the HSR minus monitor well MW-302. This well is screened in a clay zone with saturated sand seams that may not be hydraulically connected to the other saturated zones at the site.

Based on our interpretation of the information that this study will provide, the Department of Environmental Quality may recommend vertical profiling of groundwater quality at areas of concern at the WRS site. Please provide to this office the requested information by August 20, 2004. If you should have any comments or questions regarding this matter, I can be reached directly at the number listed below.

Sincerely,

Douglas D. Thompson

Douglas D. Thompson, Senior Geologist
Groundwater Section
Water Division
517-335-3380

cc: Mr. Christopher Hubbell, WRS
Ms. Janice Heuer, Cadillac District Office, DEQ
Mr. Rick Rusz, DEQ
Mr. Thomas J. Weston, P.E., DEQ